

REMARKS/ARGUMENTS

Claims 1-65 were pending in the present application before this amendment as set forth above. Of them, claims 1, 4, 6, 8-10, 13, 14, 28, 31, 33-37, 48, 51 and 53-56 were examined, and claims 2, 3, 5, 7, 11, 12, 15-27, 29, 30, 32, 38-47, 49, 50, 52 and 57-65 were withdrawn as being drawn to non-elected subject matter. By the amendment, claims 1, 8, 14, 28 and 48 are amended.

In the March 19, 2008 Office Action, the Examiner rejected claims 1, 4, 6, 8-10, 13, 14, 28, 31, 33-37, 48, 51 and 53-56 under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 1, 4, 6, 8-10, 13 and 14 were rejected under 35 U.S.C. 103(a) as being unpatentable over Wax (CH2847 IEEE, 1990, 2157-2160) in view of Li et al. (US 6,406,840) and further in view of Whitney (US 2002/0159642). Moreover, claims 1, 4, 6, 8-10, 13, 14, 28, 31, 33-37, 48, 51 and 53-56 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that is regarded as the invention. Further to the rejections, the Examiner objected to claims 1, 8, 14, 28 and 48 for informalities. The Examiner also objected to the specification because of informalities. Additionally, the Examiner indicated that the originally filed declaration was defective.

In response, as set forth above, claims 1, 8, 14, 28 and 48 and the specification have been amended to correct the informalities, as suggested by the Examiner, so that the amended claims, written description, abstract and drawings are consistent with each other.

Support for the amendments can be found in the specification and drawings, as originally filed. Applicant asserts that no new matter is added.

Any amendments to the claims not specifically referred to herein as being included for the purpose of distinguishing the claims from cited references are included for the purpose of clarification, consistence and/or grammatical correction only.

Additionally, applicant respectfully submits herewith a fully executed declaration that has corrected oversights in the originally filed declaration.

It is now believed that the application is in condition for allowance at least for the reasons set forth below and such allowance is respectfully requested.

The following remarks herein are considered to be responsive thereto.

Specification Objections:

In the March 19, 2008 Office Action, the Examiner objected to the specification because it contained an embedded hyperlinks, and trademarks written in small letters.

In response, as set forth above, applicant has amended the specification to delete the embedded hyperlinks of “(http:\\www.e-cell.org)” in the paragraph from page 4, lines 6-15 and “gotnet.com.” in the paragraph from page 16, lines 30-38 through page 16, line s 1-4, and rewrite the trademarks of “SNAPTIDE” in the paragraph from page 19 and “CYTOSENSOR” in the paragraph from page 32, lines 20-31 in capital letters, as suggested by the Examiner.

Therefore, applicant respectfully requests the specification objections be withdrawn.

Additionally, applicant has also amended the paragraph from page 72, lines 9-21 of the specification to provide a clear and precise definition of the “at least one defined action”. Moreover, the paragraph has been amended to describe the iterative process of refinement of the agent classification can be controlled by a confidence level. Support for the amendment can be found in, for example, the paragraphs from page 69, lines 36-38 through page 74, lines 1-31 of the specification, and Figs. 8 and 22-24 of the drawings, as originally filed. Thus, no new matter is added.

Claim Objections:

The Examiner objected to claims 1, 8, 14, 28 and 48 because step identifiers in claims 1, 14, 28 and 48 were provided with improperly placed periods, and the use of capitalized term of “Viral” was not consistent with what the art used in the filed.

In response, as set forth above, claims 1, 14, 28 and 48 have been amended to delete the improperly placed periods in the step identifiers, and claim 8 has been amended to replace the capitalized term of “Viral” with “viral”, as suggested by the Examiner.

Accordingly, applicant respectfully requests the claim objections to claims 1, 8, 14, 28 and 48 be withdrawn.

Claim Rejections under 35 U.S.C. 112:

In the Office Action, claims 1, 4, 6, 8-10, 13, 14, 28, 31, 33-37, 48, 51 and 53-56 were

rejected under 35 U.S.C. 112, second paragraph.

Applicant respectfully submits that claims 1, 28 and 48, as amended, particularly point out and distinctly claim the subject matter of the current invention, respectively.

For example, the limitation of “one defined action” recited in amended claim 1 is well described in the paragraphs from page 69, line 37-38 through page 74, lines 1-31 of the specification, particularly in the amended paragraph from page 72, lines 9-21. The “one defined action” is corresponding to an experimental protocol that defines the type and quantity of cells to be exposed to an agent, and sets of data (a plurality of measurable quantities) to be collected and analyzed for discriminating the agent. Additionally, for the metes and bounds of the limitation of “iteratively repeating steps (d)-(g) until the agent is discriminated” recited in claim 1, as described in the amended paragraph of the specification, one skilled in the art would know that a desired confidence level could be used to control when the iteratively process would suffice in the discrimination of the agent.

Regarding claim 28, the metes and bounds of the limitation of “iteratively repeating steps (e)-(h) until a plurality of classes for the agent is separated” is clearly defined with a desired corresponding confidence level. For example, in one embodiment, the desired corresponding confidence level is about 90%. (See, paragraph from page 73, lines 19-26 of the specification and Fig. 23 of the drawings.)

Additionally, the metes and bounds of the limitation of “iteratively repeating steps (f)-(i)” recited in claim 48 is defined with a desired robustness factor. (See, paragraph from page 74, lines 18-31 of the specification and Fig. 24 of the drawings.)

Therefore, applicant respectfully requests the 112 rejections to claims 1, 4, 6, 8-10, 13, 14, 28, 31, 33-37, 48, 51 and 53-56 be withdrawn.

Claim Rejections under 35 U.S.C. 101:

In the March 19, 2008 Office Action, the Examiner rejected claims 1, 4, 6, 8-10, 13, 14, 28, 31, 33-37, 48, 51 and 53-56 under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

In response, as set forth above, without acquiescing in the propriety of the Examiner's rejections and to facilitate the prosecution of the current application, applicant has amended

claims 1, 28 and 48 according to the Examiner's suggestion. Specifically, in amended claim 1, a step of "storing the classification of the agent for use" has been recited. A step of "storing the plurality of classes for the agent for use" has been added in amended claim 28. Claim 48 has also been amended to recite a step of "storing the obtained class for the agent for use". Support for the amendments can be found in the originally filed specification, particularly in paragraph from page 72, lines 27 through page 74, lines 1 and 2. Thus, no new matter is added.

Accordingly, applicant respectfully submits that the 101 rejections to claims 1, 4, 6, 8-10, 13, 14, 28, 31, 33-37, 48, 51 and 53-56 have been overcome, and thus requests the 101 rejections to claims 1, 4, 6, 8-10, 13, 14, 28, 31, 33-37, 48, 51 and 53-56 be withdrawn.

Claim Rejections under 35 U.S.C. 103:

In the March 19, 2008 Office Action, claims 1, 4, 6, 8-10, 13 and 14 were rejected under 35 U.S.C. 103(a) as being unpatentable over Wax in view of Li et al. and further in view of Whitney. Applicant respectfully traverses the rejection made by the Examiner at least for the reasons set forth below.

Claim 1, as amended, recites a method for discriminating an agent that includes the steps of:

- “(a) constructing a decision tree having a plurality of branches, *each branch corresponding to at least one defined action*, wherein each branch comprises a plurality of successive branches, each successive branch corresponding to the at least one defined action;
- (b) providing a conditioned environment sensitive to the agent;
- (c) obtaining data from response of the agent to the conditioned environment;
- (d) extracting features from the obtained data;
- (e) selecting a branch from the decision tree corresponding to the features;
- (f) *performing on the features the at least one defined action corresponding to the branch*;
- (g) producing a classification of the agent;
- (h) *iteratively repeating steps of (d)-(g) until the agent is discriminated*; and
- (i) storing the classification of the agent..” (Emphasis added.)

The method for discriminating a unknown agent requires actively planning and performing experiments, collecting specific measurements on the experiments, and selecting algorithms for classification of the unknown agent from a set of data collected from the experiments. The method in one embodiment has the following steps: in step (a) a decision tree having a plurality of branches with each branch corresponding to at least one defined action is constructed. The step involves in planning for the creation of new data, selecting a series of experiments that maximize the potential for agent discrimination. In step (b), a conditioned environment sensitive to the agent is provided for performing the experiments. In step (c), a set of data is obtained from response of the agent to the conditioned environment in the experiments. Then, features are extracted from the set of data in step (d). In step (e), a branch is selected from the decision tree corresponding to the features. In step (f), the at least one defined action corresponding to the branch is performed on the feature. This describes dynamic action on the sample and apparatus. In step (g), a classification of the agent is produced. Then, steps of (d)-(g) are iteratively repeated until the agent is discriminated. The final result of the classification of the agent is stored for use. (See Example 6 of the specification, and Figs. 8 and 22-24 of the drawings.)

In contrast, as understood by applicant, Wax describes an approach at construction of a tree-structured classifier from *a known, existing set of training data*. The classifier applies multiple levels of discriminators, branching at each point as a result of tests run on *the existing data set*.

Whitney describes a closed-loop process of a trial-and-error approach “for designing algorithms that allow for fast retrieval, classification, analysis or other processing of data, *with minimal expert knowledge of the data being analyzed*, and further, *with minimal expert knowledge of the math and science involved in building classifications and performing other statistical data analysis*” (Whitney, Abstract, emphasis added). *The data to be processed is a fixed, existing data set.*

Li discloses “cell arrays comprising a plurality of tubes containing populations of cells that are immobilized therein. The arrays are particularly useful for conducting comparative cell-based analyses.” (Li, Abstract.)

Therefore, as amended, the method of the amended claim 1 has many patentable and novel steps, as set forth in the following Table 1, which are not disclosed, taught or suggested in

Wax, Li and Whitney, taken alone or in combination.

Table 1: Comparison of Recitations of Claim 1 of the Present Application with Wax, Li and Whitney (“√” or “×” indicates Wax/Li/Whitney has or does not have the recitation of Claim 1, respectively)

Recitations of Claim 1 of the Present Application	Wax	Li	Whitney
A method for discriminating an agent, comprising the steps of:	√	×	√
(a) constructing a decision tree having a plurality of branches, <i>each branch corresponding to at least one defined action;</i>	×	×	×
(b) providing a conditioned environment sensitive to the agent;	×	√	×
(c) obtaining data from response of the agent to the conditioned environment;	×	√	×
(d) extracting features from the obtained data;	×	×	√
(e) selecting a branch from the decision tree corresponding to the features;	√	×	√
(f) <i>performing on the features the at least one defined action corresponding to the branch;</i>	×	×	×
(g) producing a classification of the agent;	√	×	√
(h) <i>iteratively repeating steps of (d)-(g) until the agent is discriminated;</i> and	×	×	×
(i) storing the classification of the agent for use.	×	×	√

In summary, *none of Wax, Li and Whitney, taken alone or in combination, disclose, teach or suggest* the method for discriminating an agent that, among other things, has the following patentable and inventive steps;

- (1) constructing a decision tree having a plurality of branches, *each branch corresponding to at least one defined action,*
- (2) *performing on the features the at least one defined action corresponding to the branch;*
- (3) *iteratively repeating steps of (d)-(g) until the agent is discriminated,*

as recited in amended claim1 of the present invention.

Accordingly, applicant respectfully submits that the Examiner has failed to make a *prima facie* case to support the rejections to claim 1 under 35 U.S.C. 103(a) over Wax in view of Li and further in view of Whitney. First, there is no suggestion or motivation to modify the references or combine the reference teachings. Second, there is no reasonable expectation of success of combining the reference teachings. Finally, the combination of references does not teach or suggest all elements of Applicant's claims.

In supporting the obviousness rejections under 35 U.S.C. 103, the Examiner "bears *the initial burden...of presenting a prima facie case of unpatentability*...After evidence or argument is submitted by the applicant in response, patentability is determined *on the totality of the record*." *Ex parte Wada and Murphy*, BPAI Appeal No. 2007-3733 (January 14, 2008), and "*Office personnel must articulate*", among other things, "*a finding that the prior art included each element claimed ...*", MPEP 2143 (A)(1). The "*unwitting application of hindsight*" is *inappropriate*. *Ex parte So and Thomas*, BPAI Appeal No. 2007-3967 (January 4, 2008). In other words, the Examiner's "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). (MPEP 2142). (Emphasis added.)

Therefore, for at least the foregoing reasons, independent claim 1 is patentable under 35 U.S.C. 103(a) over Wax, Li and Whitney.

Accordingly, claims 4, 6, 8-10, 13 and 14, which depend from now allowable amended claim 1, are patentable at least for this reason.

CONCLUSION

Applicant respectfully submits that the foregoing Amendment and Response place this application in condition for allowance. If the Examiner believes that there are any issues that can be resolved by a telephone conference, or that there are any informalities that can be corrected by an Examiner's amendment, please call the undersigned at 404-495-3678.

Respectfully submitted,

Appl. No. 10/510,500
Response Dated June 19, 2008
Reply to Office Action of March 19, 2008

June 19, 2008

MORRIS, MANNING & MARTIN, LLP



Tim Tingkang Xia
Attorney for Applicant on the Record
Reg. No. 45,242

MORRIS, MANNING & MARTIN, LLP
1600 Atlanta Financial Center
3343 Peachtree Road, N.E.
Atlanta, Georgia 30326-1044
Phone: 404-233-7000
Direct: 404-495-3678
Customer No. 24728